CLAIMS

1. An adaptive motion direction detecting apparatus comprising:

an image input unit for inputting two-dimensional pixel data of an object;

a response output unit including a plurality of response element arrays each having different time phases, each of said response element arrays including a plurality of response elements each generating a response output for one of a plurality of local areas partly superposed thereon, said two-dimensional pixel data being divided into said local areas;

a correlation function calculating unit for calculating spatial and time correlation functions between the response outputs of said response elements;

a response output selecting unit for selecting response outputs of said response output unit for each of said local areas in accordance with said spatial and time correlation functions; and

a motion direction detecting unit including a plurality of detection elements each corresponding to one of said response elements of each of said response element arrays, each of said detection elements detecting a motion direction of said object at one of said local areas in accordance with selected response outputs for said one of said local areas.

2. The apparatus as set forth in claim 1, wherein said time phases are 0° , 90° , 180° and 270° .

3. The apparatus as set forth in claim 1, wherein said response input unit divides said two-dimensional pixel data into said local areas by performing a Gaussian function upon said two-dimensional pixel data.

4. An adaptive motion direction detecting apparatus comprising:

an image input unit for inputting two-

dimensional pixel data of an object having coordinate k;

a response output unit including response elements having coordinate m and coordinate n, said coordinate m corresponding to one of a plurality of a local areas partly superposed thereon, into which said two-dimensional pixel data are divided, each of said response elements generating a response output $\eta_{m,n}(t)$ depending on a spatial response function $S_{m,k}$ and a time response function $T_n(t)$, said spatial response function being a Gaussian function centered at said coordinate m;

a correlation function calculating unit for calculating spatial and time correlation functions $\Gamma_{m,n;m',n'}$ between the response outputs $\eta_{m,n}(t)$ and $\eta_{m',n'}(t)$;

a response output selecting unit for selecting response outputs of said response output unit in accordance with a said spatial and time correlation functions $\Gamma_{m,n;m',n'}$; and

a motion direction detecting unit including detection elements having coordinate i corresponding to coordinate m, each of said detection elements detecting a motion direction of said object at coordinate i in accordance with selected output response output for said coordinate i.

5. An adaptive motion direction detecting method comprising the steps of:

inputting two-dimensional pixel data of an object;

generating a response output for one of a plurality of local areas partly superposed thereon, said two-dimensional pixel data being divided into said local areas;

calculating spatial and time correlation functions between the response outputs;

selecting response outputs for each of said local areas in accordance with said spatial and time correlation functions; and

detecting a motion direction of said object at one of said local areas in accordance with selected response outputs for said one of said local areas.

6. The method as set forth in claim 5, wherein said response output has time phases of 0° , 90° , 180° and 270° .

7. The method as set forth in claim 5, wherein said two-dimensional pixel data are divided into said local areas by performing a Gaussian function upon said two-dimensional pixel data.

8. An adaptive motion direction detecting method comprising the steps of:

inputting two-dimensional pixel data of an object having coordinate k;

dividing said two-dimensional data into a plurality of local areas partly superposed thereon, said local areas having spatial coordinate m and time coordinate n;

generating a response output $\eta_{m,n}(t)$ depending a spatial response function $S_{m,k}$ and a time response function $T_n(t)$, said spatial response function being a Gaussian function centered at said coordinate m;

calculating spatial and time correlation functions $\Gamma_{m,n;m',n'}$ between the response output $\eta_{m,n}(t)$ and $\eta_{m',n'}(t)$;

selecting response outputs of said response output unit in accordance with said spatial and time correlation functions $\Gamma_{m,n;m',n'}$; and

detecting a motion direction of said object at coordinate i corresponding to said coordinate m in accordance with a selected output response output for said coordinate i.